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Current References

Data Management For Global Change

May 1990

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Oceanographic Data Center

DATA MANAGEMENT FOR GLOBAL CHANGE:
A Selective Bibliography
May 1990

High on NOAA's agenda is the goal of understanding, and ultimately predicting, climate change. In our earlier publication, (Global Climate Change: A Selective Bibliography, Feb. 1990), we presented a selection of references related to the global climate change of most direct concern to NOAA.

This bibliography lists references to recently published documents held by the NOAA Library that deal with various aspects of collecting, storing and disseminating the vast amounts of data required to analyze changes in the global environment. Like other publications in this series, the bibliography is not intended to be a comprehensive literature review.

References are listed under six categories: Planning and Systems Design; Data Collection; Quality Control; Storage; Access and Dissemination; and, General. The citations are listed alphabetically by author within each subject category.

Questions about this material may be addressed to the Reference Desk, NOAA Central Library, 6009 Executive Boulevard, Rockville, MD 20852, or call (301) 443-8330. Suggestions for topics to be included in future issues of this bibliographic series are welcome.

A. PLANNING AND SYSTEMS DESIGN:

01. Churgin, James.
Status report on WOCE data management planning. Abstract of presentation at the AGU Fall Meeting, December 7-11, 1987. Eos, 64(44): 1309, November 3, 1987.
ROCKVILLE: PER

The speaker outlined data management plans for the U.S. component of the World Ocean Circulation Experiment (WOCE). A distributed system was described, with three types of components: WOCE Data Centers, National Data Centers, and a WOCE Data Management Unit. WOCE Data centers will normally be located at a research institution or university where scientists are actively involved in WOCE research. National Data Centers will usually be governmental organizations that receive and store WOCE data sets as separate, identifiable data bases. The National Oceanographic Data Center (NODC) will, in addition, work with WOCE in developing joint specialized data management facilities. The WOCE Data Management Unit will act as an information center or "control tower" in monitoring WOCE data flow. Experience with pilot data dissemination units at the University of Delaware and elsewhere was summarized, and a progress report was given on the status of network access by the oceanographic community.

02. Dai Ruguang.
Management of oceanographic data and international cooperation in China. Pp. 342-344. In: New developments in marine science and technology..., proceedings of the 22nd Annual Conference of the Law of the Sea Institute, edited by Lewis M. Alexander, Scott Allen, and Lynne Carter Hanson. Honolulu: Law of the Sea Institute, [1989]. 530pp.
USGS (Reston): 530(215) qL414p 1988

The management of oceanographic data in China and China's participation in international atmospheric and marine research projects are discussed, and the mission of the National Oceanographic Data Center of China, its resources, and its operating environment are described.

03. Eddy, Amos.
Optimal climate data utilization: a climatic data acquisition, archiving, processing and dissemination system for resource management. [Geneva:] World Meteorological Organization, September 1987. 103 pp.
ROCKVILLE: QC 851.W674 No. 25

This document provides a detailed description of a system which will acquire climatological data, process it and present it to policy and decision makers in a format which will show clearly and explicitly the utilization of climate data and information in resource management and optimal decision making. After giving a brief description of a hypothetical stand-alone system, the author discusses in concrete terms user products derived from climate data, the data base and its processing, implementation of a system, interfacing with other systems, and future configurations. Appendixes include, among other things, a discussion of system components and prices,

elements of a data bank, and 50 pages describing nine other systems available in the U.S. for resource management.

04. Godin, Raymond H.

Developing technologies within the oceanographic component of the World Climate Research Program. Pp. 337-341. In: New developments in marine science and technology..., proceedings of the 22nd Annual Conference of the Law of the Sea Institute, edited by Lewis M. Alexander, Scott Allen, and Lynne Carter Hanson. Honolulu: Law of the Sea Institute, [1989]. 530pp.

USGS (Reston): 530(215) qL414p 1988

The Tropical Oceans and Global Atmosphere Program (TOGA) and the World Ocean Circulation Experiment (WOCE) have been developed jointly by the International Oceanographic Commission's Committee on Climatic Changes and the Ocean (CCCO), the Joint Scientific Committee (JSC) for the World Climate Research Global Programme (WCRP), and the World Meteorological Organization (WMO). WOCE is a principal component of Stream 3 within the WCRP, which is concerned with the prediction of decadal climate change. The three Core Projects of WOCE, the sources and types of data to be gathered for the experiment, and planning activities for WOCE are described.

05. Guptill, Stephen C.

Desirable characteristics of a spatial data base management system. Pp. 278-281. In: Auto-carto 8, Proceedings of the Eighth International Symposium on Computer-Assisted Cartography, Baltimore, Maryland, March 29-April 3, [1987], edited by Nicholas R. Chrisman. [Falls Church, VA: American Society for Photogrammetry and Remote Sensing, and American Congress on Surveying and Mapping, 1988.] 763 pp.

ROCKVILLE: GA 102.4.E4 A87 1988

Spatial data base management systems must meet the requirements of conventional data base management systems as well as provide special facilities to handle spatial data. Characteristics such as the independent handling of feature, attribute, topology, and coordinate data and the support for alternate geometric representations are desired. This set of characteristics serves not only as criteria for evaluating existing systems, but also as input for future system design.

06. Hastings, Jordan T., and Marjorie P. McGuirk.

Overview of SWORD: design and development. Pp. 48-52. In: Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342 p.

ROCKVILLE: QC 874.3.I5 1990

The goal of SWORD (Synoptic-scale Weather Online Research Database) is to provide a "self-service, multimedia, central clearing house" for atmospheric sounding data, the primary purpose being to encourage prompt, practical evaluation of wind profiler data in conjunction with other synoptic-scale measurements. Planning was

begun in the Fall of 1988 by the Cooperative Institute for Research in Environmental Sciences, and delivery of a first-cut working system is expected by mid-1990.

07. Hsiao, T. Thomas.
Test and evaluation software for a prototype network of water level measurement stations. Pp. 358-363. In: Oceans '86: Conference Record,...Washington, D.C., September 23-25, 1986. [New York:] IEEE, 1986. 5v. 1472 pp.
ROCKVILLE: REF TC 1505.C63 1986

The National Ocean Service is replacing its National Water Level Observation Network with the Next Generation Water Level Measurement System. A prototype network of 20 field units will be used to test and evaluate the initial design concept and to define final technical specifications. Special test and evaluation software was developed to support this field evaluation. The latter software, which is written for an IBM PC/AT, acquires data directly from the field units via telephone and via the Geostationary Operational Environmental Satellite system. These data are decoded, reformatted, and maintained in a relational database. The software exports data for supplementary analysis by other applications that use Lotus 1-2-3 spreadsheets and graphic output, and others that use the existing tides analysis software.

08. Intergovernmental Oceanographic Commission.
Manuals and guides, No.19: guide to IGOSS specialized oceanographic centres (SOCs). [Paris:] Unesco, 1988. [15 pp.]
ROCKVILLE: GC 37.5.I55 No.19

This guide was prepared in response to resolutions of the Joint IOS-WMO Working Committee for IGOSS (Integrated Global Ocean Station System). Its main objective is to provide Member States of IOC and Members of WMO considering the establishment of IGOSS Specialized Oceanographic Centres (SOCs) with information regarding the international responsibilities they would assume in so doing. At a later stage it is planned that this Guide will become a part of the IGOSS Guide to the IGOSS Data Processing and Services System (IDPSS).

09. Klopfenstein, Rex C.
A management information system for the National Ocean Service's Next Generation Water Level Measurement System (NGWLMS). Pp. 364-369. In: Oceans '86: Conference Record,...Washington, D.C., September 23-25, 1986. [New York:] IEEE, 1986. 5v. 1472 pp.
ROCKVILLE: REF TC 1505.C63 1986

To manage effectively the development, acquisition, and operation of the NGWLMS, a special-purpose management information system was designed featuring: project scheduling and cost reporting, item tracking, and document comparison. Th NGWLMS project was structured as a six-level, parent/subtask hierarchy with no restrictions on interlevel predecessor task relationships; two categories of task schedules and cost data are maintained--planned and current. Several databases are used to track items, such as proposals vs. specifications or test results vs. test plans.

10. Lai, Pohchin.
Feasibility of geographic information systems approach for natural resource management. Environmental management, 14(41): 73-80, Jan/Feb 1990.
ROCKVILLE: PER

Geographic information systems (GIS) technology is altering the work environment for planning and decision-making tasks. A resource application is described here which makes use of the GIS technology. Some cost estimates are provided and reasons given for the fairly slow development toward an integrated resource database for environmental planning and management. An attempt is made to identify some of the constraints of such an integrated database approach toward environmental assessment.

11. Lee, Y.C., and G.Y. Zhang.
Developments of geographic information systems technology. J. Surv. Engng. Am. Soc. Civ. Engrs., 115(3): 304-323, 1989.
ROCKVILLE: PER

The development of geographic information systems (GIS) has been closely linked to advances in computer technology. This paper examines the hardware and software components of GIS, the latest developments in these components, and how they will shape the future of GIS. The main hardware factors that influence the performance and capacity of a computer system are described and recent developments in these areas are discussed. The paper then reviews a number of important software tools and techniques that help to produce more powerful, reliable, and usable software. Finally, the special database requirements of a GIS are presented to illustrate the complexity of a GIS, the problems caused by the need to integrate geometric and nongeometric data, and the advantages of a distributed system.

12. Maher, Robert V.
Applications of GIS to the ocean environment. Pp. 1065-1067. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

Geographers and computer specialists have developed geographic information systems (GIS) for land-based decision making in resource management. These systems provide a set of analysis and display functions suitable for the land data model. This paper describes some important differences between land and ocean information systems. A preliminary data model should have the ability to store the locations of features in (x, y, z) reference space. Each feature may be a point, line, contour, polygon, pixel, or volume record in a common database management system. In ocean information systems the analysis and display functions have to be able to handle the dynamic, continuous nature of this three-dimensional environment.

13. Ramster, J.W., G.A. Robinson, and N.G.T. Fannin.
Presenting oceanographic data spatially: dilemma or opportunity? Pp. 720-723. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

A proposal to create a computer-based atlas of the seas around the United Kingdom is currently being evaluated by British oceanographers and digital cartographers. Some novel features are that both on-line queries and access via floppy disk would be possible, and a high-quality hard copy would be generated every five years or so. Furthermore, any marine scientist could have a summary of his data incorporated into the computer-based atlas, thus enabling the atlas to develop and expand. A key aspect currently under discussion is the way in which data that are known to vary with season or periodically in some other way should be displayed. Other talking points are the resources needed to support such a project and the ways in which its general scientific credibility can be established and maintained. This paper summarizes the discussions to date, in the hope that some participants may be able to add to them from their experience, while others may reduce their own problems with similar projects that are just beginning.

14. Rew, Russell K., and Glenn P. Davis.
The Unidata netCDF: software for scientific access. Pp. 33-40. In: Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342p.
ROCKVILLE: QC 874.3.I5 1990

The purpose of the Network Common Data Form (netCDF) data access library is to support the creation, access, and sharing of scientific data in a form that is self-describing and network-transparent. This paper describes the background and evolution of the interface, describes the data abstraction it supports, compares netCDF with other interfaces, discusses experience with the use of the software in meteorological applications, and describes future plans.

15. Ricketts, Peter J., Alan R. McIver, and Michael J.A. Butler.
Integrated information systems, the key to coastal zone management. Pp. 4138-4150. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. New York: A.S.C.E., 1989 [4978 pp.]
ROCKVILLE: HT 392.S94 1989

The need for environmental protection and conservation, on the one hand, and the increasing pressure of human activity, on the other, lead inevitably to conflict in coastal and marine areas. Before any fair resolution of these conflicts can be achieved, a comprehensive knowledge of the resources and uses of the coastal and marine environment is required. This information must then be placed in the hands of decision-makers in a usable form so that they can intelligently address and satisfy the interests of the various stakeholders. In an unprecedented pilot study, focused on the dynamic and controversial international waters of the Gulf of Maine region, the Canadian government and representative industry are seeking to create interfaces among a wide selection of databases which will enable data to be displayed on an electronic base map at a scale of 1:2 million, with higher resolution data for many areas and themes incorporated into the system. If successful, the concept will be viewed as a pilot project that could be applied to other coastal and marine areas or even the entire eastern Canadian coastline and associated marine environment.

16. U.S. Interagency Working Group on Data Management for Global Change.
Interagency session on data management for global change. Washington, D.C.: National Oceanic and Atmospheric Administration, [1989]. [71 pp.]
ROCKVILLE: QC 981.8.C5 I573 1989

A compilation of information papers and agenda intended for participants in the session of the Interagency Working Group held on March 3, 1989, in Washington, D.C. The information papers include, among others, the Federal and community rapporteurs' reports on the Forum for Data Management for Global Change held on December 14, 1988; the statement of work for a systems development and implementation plan for a virtual national data and information system for global change; an action summary of the Sixth Session of the Interagency Working Group; a list of subgroups; ; and the February 1989 draft report of the IGBP Working Group on Data and Information Systems meeting at Geneva in January 1989.

17. Webster, Ferris.
Technology and data management: U.S. science community views. Pp. 345-351. In: New developments in marine science and technology..., proceedings of the 22nd Annual Conference of the Law of the Sea Institute, edited by Lewis M. Alexander, Scott Allen, and Lynne Carter Hanson. Honolulu: Law of the Sea Institute, [1989]. 530pp.
USGS (Reston): 530(215) qL414p 1988

This paper summarizes the findings contained in a report entitled Geophysical Data: Policy Issues to be published by the National Research Council's Committee on Geophysical Data in 1988. Guidelines are given regarding the rights and responsibilities of geophysicists for data that they collect and their access to data collected by others, and regarding the formulation of policy and procedures by Federal agencies engaged in geophysical activities. Text of a proposed Federal policy for in situ ocean data is appended as "Addendum A".

18. Withee, Gregory W., and Douglas R. Hamilton.
Opportunities in oceanographic science offered by new advances in data management. Pp. 322-332. In: New developments in marine science and technology..., proceedings of the 22nd Annual Conference of the Law of the Sea Institute, edited by Lewis M. Alexander, Scott Allen, and Lynne Carter Hanson. Honolulu: Law of the Sea Institute, [1989]. 530pp.
USGS (Reston): 530(215) qL414p 1988

Increasing opportunities in oceanography are possible through new technological and data management developments. For example, more ocean measurements are available from an increasingly complex set of sensors, both in-situ and satellite. Many of these data are available for use a few days after observation. New technology is clearly affecting the way oceanographers gather, relay, and use ocean data. Systems for integrating and assisting in data interpretation will enable us to solve many oceanographic problems, including those in coastal regions and the Exclusive Economic Zone.

19. World Climate Data Programme.
Report of the International Planning Meeting on Climate System Monitoring, 14-18 December 1987, Washington, D.C., USA. [Geneva:] World Meteorological Organization, [1988]. [21 pp.]
ROCKVILLE: QC 851.W673 No.2

After the usual preliminaries the participants undertook a review of the current state of climate system monitoring and actions needed in such areas as: data availability and databases, indices and parameters used, the CSM Monthly Bulletin and output from models, interaction with other data/information systems, problems and possible solutions relative to climate monitoring, and definition of a methodology for developing a comprehensive monitoring system for climate and global change. Coordination with other international programs and organizations and the global climate system were discussed as well. The agenda, a list of participants, and a list of technical presentations are appended.

B. DATA COLLECTION:

01. Agreen, R. W., R.E Cheney, and S.L. Patterson.
GEOSAT altimeter data management at NOAA. Abstract of presentation at the AGU Fall Meeting, December 7-11, 1987. Eos, 64(44): 1323, November 3, 1987.
ROCKVILLE: PER

The U.S. Navy's geodetic satellite (GEOSAT), designed and built at the Applied Physics Laboratory (APL) of Johns Hopkins University and launched in March 1985, carries a radar altimeter that measures distance between the spacecraft and the earth's surface along the satellite groundtrack. When combined with independent determinations of the satellite's orbital trajectory, the data obtained over the ocean enable determination of sea level and its variations. Characteristics of the reflected radar waveform can also be used to infer significant wave height and wind speed. Under agreement with the U.S. Navy, NOAA/National Ocean Service (NOS) is producing unclassified Exact Repeat Mission (ERM) Geophysical Data Records (GDRs), with distribution through the National Oceanographic Data Center (NODC). The steps of the data flow from the satellite through APL, NOS, and NODC to the research community were outlined. Factors affecting the coverage and accuracy of the data reported on GDRs were reviewed and options for new data services discussed.

02. **Argos data collection and location system (DCLS).** Pp. 151-155. In: Weather satellites: systems, data, and environmental applications, edited by P. Krishna Rao, et. al. Boston: American Meteorological Society, 1990. 503 pp.
ROCKVILLE: QC 879.5.W39 1990

The Argos DCLS was developed as a cooperative effort among the French Centre National d'Etudes Spatiales (CNES), NOAA, and NASA to provide an operational satellite-based means to collect, locate, and disseminate environmental data. The Argos DCLS will ride all NOAA satellites through NOAA-M (to about 1997). The system administration, subsystems, applications, and enhancements are described briefly.

03. Benada, J.R., D.T. Cuddy, and S.H. Jai.
Adapting the NSCAT data system to changing requirements. Pp. 473-478. In: Oceans '88: proceedings,...Baltimore, Maryland, October 31-November 2, 1988. [New York:] IEEE, 1988. 1732 pp.
ROCKVILLE: REF TC 1505.C63 1988

NSCAT is a spaceborne, 8-beam scatterometer which will measure ocean backscatter. The backscatter measurements are processed on the ground to oceanic wind vectors. Vector winds will be retrieved over 90% of the ice-free global oceans every two days for a three-year mission. The Data System is a non-real-time ground-based science data processing system. It ingests backscatter telemetry, processes it to the wind vectors, archives and distributes the wind vector data and other products. This paper describes the Data System, particularly the changes to the baseline design in response to changes in requirements.

04. Bower, Thomas E., and Thomas J. Coe.
Shipboard data acquisition and automated data analysis system. Pp. 212-215. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

Software using a Hewlett-Packard desktop computer and data acquisition system was developed to assist U.S. Coast Guard Research and Development Center personnel to conduct ship technical evaluations. This system, utilizing HP BASIC language, allows the user to collect data from up to 40 sensors with analog outputs through a menu interface. The data can be immediately reviewed on board the vessel after each test, using tables, graphic and statistical calculation techniques. A batch method of data analysis was developed in order to evaluate all the data at the end of each test day. In this way sensor malfunctions can be easily identified and corrected during the testing phase and thus improve testing reliability. Data anomalies can also be detected during the technical evaluation, facilitating a change in test direction in order to evaluate them properly.

05. Delahoyde, Frank M.
A UNIX-based system for hydrographic data acquisition and processing. Abstract of paper. P.7 In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251 pp.
ROCKVILLE: GC 10.4.E4 W68 1986

A hydrographic data acquisition, processing, and management system based upon a UNIX operating system environment is described. The system is currently implemented in Motorola MC68000-based microcomputers. Networking facilities provide for microcomputers in a specific system configuration. At sea the system permits real-time acquisition, processing, and management of hydrographic data. Supported applications include continuous measurements under way, adaptive sampling using rosette and CTD systems, and large-volume sampling. Analytical tools include 2D and 3D graphics, contouring, digital signal processing, and mathematical packages.

Performance, reliability, expandibility, and cost-effectiveness of the system are discussed.

06. Fleming, C.A., and I.H. Towend.
A coastal management database for East Anglia. Pp. 4092-4107. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. New York: A.S.C.E., 1989. 4978 pp.
ROCKVILLE: HT 392.S94 1989

A major coastal management study covering 750 km of the east coast of England has been initiated. This has entailed the collation of a vast amount of data relating to the highly diverse requirements of a management capability for the coastal zone. These data have been analyzed using a geographical information system (GIS), with the ability to handle complex data structures as well as geographical mapping of the data. Analyzing the data using this system has led to an number of significant findings as to the dominant processes on the coast. The management strategy that has been formulated is closely linked with the continuing use and updating of the system.

07. **GOES data collection system (DCS).** Pp. 146-150. In: Weather satellites: systems, data, and environmental applications, edited by P. Krishna Rao, et. al. Boston: American Meteorological Society, 1990. 503 pp.
ROCKVILLE: QC 879.5.W39 1990

The GOES DCS relays data from remote sites located at or near the Earth surface via GOES spacecraft to receiving stations within radio range. The four functional subsystems of the GOES DCS are: (1) Deployed Data Collection Platforms (DCP); (2) two operational GOES spacecraft; (3) a Command and Data Acquisition Station (DCA) at Wallops Station, VA; and the Central Data Dissemination Facility in Maryland. The system is diagrammed and applications are described.

08. Miller, Herman C.
A coastal data system for long-term comprehensive measurements of nearshore processes. Pp. 62-69. In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251 pp.
ROCKVILLE: GC 10.4.E4 W68 1986

There have been few programs for collecting long-term, comprehensive measurements of nearshore processes. As one of its objectives, the Waterways Experiment Station Coastal Engineering Research Center's Field Research Facility (FRF) in Duck, North Carolina, has been collecting these data since 1978 for coastal engineering research. This paper describes the data system that is designed to collect, analyze, and rapidly disseminate concurrent meteorological, oceanographic, survey, sediment, and photographic data.

09. Rao, P. Krishna, Susan J. Holmes, Ralph K. Anderson, Jay S. Winston, and Paul E. Lehr (Eds.).

Weather satellites: systems, data, and environmental applications. Boston: American Meteorological Society, 1990. 503 pp.
ROCKVILLE: QC 879.5.W39 1990

Compiled against the backdrop of varied and fast-developing progress in the use of meteorological satellites to observe the Earth and its environment, this book provides a comprehensive overview of the field, including a history of applied satellite meteorology. The book concentrates primarily on meteorological remote sensing applications. A separate volume on ocean applications will be published in the future. The 42 chapters are grouped under eleven headings, covering such topics as: national observing capabilities, sensors, command and data reception, central data processing and distribution, meteorological applications, land and ocean sciences applications, climate applications, agricultural applications, and future systems and applications.

10. Rasool, S.I.
Maximizing the benefits from the new technologies of oceanographic data gathering and management. Pp. 333-336. In: New developments in marine science and technology..., proceedings of the 22nd Annual Conference of the Law of the Sea Institute, edited by Lewis M. Alexander, Scott Allen, and Lynne Carter Hanson. Honolulu: Law of the Sea Institute, [1989]. 530pp.
USGS (Reston): 530(215) qL414p 1988

After listing several reasons why at present it is not possible to answer some fundamental questions concerning the buildup of greenhouse gases in the Earth's atmosphere and the consequences of that buildup, the author defines two goals which must be pursued simultaneously: precise documentation of the nature of global change that is occuring now and has taken place in the recent past, and improved ability to represent the processes of global change as realistically as possible for use in predictive models. He then briefly describes his view as to the best way to reach those goals successfully.

11. Shaw, A.E.
The Argos satellite data collection and location system. Pp. 658-670. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. [4978 pp.]
ROCKVILLE: HT 392.S94 1989

Argos is a satellite-based data collection and location system used to collect in-situ environmental data, which are coupled with accurate position information, time-tagged, and disseminated worldwide. The system was developed through a cooperative project involving French and U.S. government agencies, and will be operated on a joint basis at least through the rest of the NOAA/TIROS-N satellite series, i.e. to approximately the year 2000. Detailed information is given on system operation, including data collection, location calculation, data flow and distribution, as well as some specific products and services.

12. Soneira, Gary, William Woodward, and Chris Noe.
Marine data platforms - an interactive inventory. Pp. 4085-4091. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. [4978 pp.]
ROCKVILLE: HT 392.S94 1989

NOAA's Office of Ocean Services has completed a comprehensive survey of in situ platforms which routinely collect oceanographic and marine meteorological data. The object of the survey was to provide input for the design and implementation of an interactive database system covering marine data-collection platforms. The resultant database should form the basis for improving the management of platforms and more fully exploiting their data collection capabilities.

13. World Climate Data Programme.
Input format guidelines for World Radiometric Network data. (prepared by the World Radiation Data Centre, Voeikov Main Geophysical Observatory, USSR State Committee for Hydrometeorology), Leningrad, 1987. [Geneva:] World Meteorological Organization, [1987]. [46 pp.]
ROCKVILLE: QC 851.W673 No.4

These guidelines were prepared by the staff of the World Radiation Data Centre (WRDC) as a result of decisions taken in 1983 at a meeting on the future of the WRDC, and the guidelines implement in part the program outlined by the Executive Council of the World Meteorological Organization in June 1984. The input data format described reflects comments received from international experts and should be considered final. Parameters archived at the WRDC and examples of the forms to be used are presented in appendixes.

14. Wright, Evelyn L., and John-Paul Hosom.
Seismic-reflector database software. Pp. 184-190. In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251pp.
ROCKVILLE: GC 10.4.E4 W68 1986

The Seismic Data Analysis (SDA) software system facilitates generation of marine seismic-reflector databases composed of reflector depths, traveltimes, root-mean-square and interval velocities, geographic coordinates, and identifying information. System processes include digitizing of seismic profiles and velocity semblance curves, merging of velocity and navigation data with profile traveltime data, calculation of reflector depths in meters, profile and map graphic displays, data editing and smoothing, and entry of finalized data into a comprehensive database. An overview of concepts, file structures, and programs is presented.

C. QUALITY CONTROL:

01. Fish, Robert G., and Janet L. Burton.
Automated methods for quality control of physical oceanographic data. Pp. 189-193. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

One of the primary goals of the National Oceanographic Data Center (NODC) is to provide quality marine environmental data services in a timely and cost-effective manner. Accordingly, the NODC has compiled an extensive global database of oceanographic observations and synthesized summaries and computations of those observations. The technical correctness of the database and maintenance of data currency require a continuous flow of both new and revised data which can be evaluated rapidly and inexpensively. The need for such data flow demands that the Center actively locate and acquire data and provide efficient mechanisms for quality control of the data prior to entry into the database. In order to improve this process within the Data Center, the NODC is now developing a new automated system for data quality assurance.

02. Guttman, Nathaniel B.
Measuring the performance of data validators. Pp. 118-119. In: Sixth Conference on Applied Climatology, March 7-10, 1989, Charleston, S. Carolina. Preprints. Boston, MA: American Meteorological Society, 1989. [296pp.]
ROCKVILLE: QC 980.C66 1989

Data validation is necessary if the National Climatic Data Center (NCDC) is to meet its commitment to archive and disseminate data and information of high quality. Although advances in computer technology have led to increased reliance on automated checking procedures, manual review of computer output is still required to assure high quality. Since human action in the validation process is not as predictable as the behavior of software, NCDC has initiated a system to measure how often validators make the proper decision when taking actions on choices that are well defined by the meteorological conditions causing suspicious data. This paper discusses some of the results from the measurement process.

03. Lockwood, Millington, and Douglas Hamilton.
Identifying oceanographic data gaps in the EEZ. Pp. 1359-1364. In: Oceans '86: conference record,...Washington, D.C., 23-25 September 1986. [New York:] I.E.E.E., 1986. 1472 pp.
ROCKVILLE: TC 1505.C63 1986

The issuance of the Presidential Proclamation on the Exclusive Economic Zone (EEZ) in March of 1983 has resulted in an appraisal of the state of knowledge of oceanographic data in the coastal waters within 200 miles of the United States and its territorial possessions. This appraisal revealed a significant gap in our knowledge of the region in certain ocean parameters and in certain frontier areas, i.e., Alaska and the Pacific Trust Territories. An analysis of the data holdings in the National Oceanographic Data Center, several reviews held by the National Oceanic

and Atmospheric Administration, the Department of the Interior, and the National Advisory Committee on Oceans and Atmosphere have further verified these data gaps and the impacts of these gaps on the mandate to explore and assess the resources of the EEZ.

04. Redmond, Kelly T.
Quality control of cooperative observer climate data. Pp. 120-121. In: Sixth Conference on Applied Climatology, March 7-10, 1989, Charleston, S. Carolina. Preprints. Boston, MA: American Meteorological Society, 1989. [296 pp.]
ROCKVILLE: QC 980.C66 1989

Preliminary examination of the National Climatic Data Center (NCDC) edits at state climate offices over the past few years has suggested that an unacceptably large number of valid observations were being improperly rejected. As a result, a pilot project has been initiated, under the coordination of the Western Regional Climate Center, to involve local (state) expertise in the quality control decisions for each state. Desirable quality control features and procedures used in the project are described.

05. White, Warren B., Stephen E. Pazan, Gregory W. Withee, and Christopher Noe.
Joint Environmental Data Analysis (JEDA) Center for the quality control of upper ocean thermal data in support of TOGA and WOCE. Eos, 69(9):122-123, 131, March 1, 1988.
ROCKVILLE: PER

The initial objective of the JEDA Center is to maintain the tropical Pacific Ocean subsurface thermal data base in support of scientific research conducted by the TOGA research program. The JEDA Center combines the strengths of NODC in locating, acquiring, and reformatting data with the Scripps Institution of Oceanography's (SIO's) ability to provide quality control, objective analysis, and scientific results. The JEDA Center supplies information, as well as data sets, issuing an annual report, a user's guide, and a monthly bulletin of thermal data products. Magnetic tape archives are maintained at NODC and SIO. Over the next three years the JEDA Center will extend the intake, quality control, and analysis of available upper ocean thermal data from the tropical Pacific to the entire Pacific in 1988, to the Indian Ocean in 1989, and to the North Atlantic in 1990 as a part of the long lead time activities associated with the Core 1 program of WOCE.

06. Withee, G.W., and W.C. Blasingame.
Data quality: a systems approach. Pp. 58-66. In: Automated Meteorological Systems, proceedings of a WMO conference.... Geneva: World Meteorological Organization, 1975. 380 pp.
ROCKVILLE: QC 851.W6445

The evaluation of quality of data from automatic marine stations (buoys) in a systems sense involves evaluation of the buoys system with all its subsystems as well as all the processes (hardware and software) that affect the quality of data delivered to the user. Data quality is defined in terms of total system error, which itself

is defined as the difference between a measured environmental error as received by the user and the true or desired value as it existed at the time and space medium where the measurement was presumably made. This paper describes the NDBO (NOAA Data Buoy Office) program for investigating the data quality, including the error simulation program, the engineering test and evaluation, the operational evaluation, and the spatial test and evaluation. Results of the error simulation program, of the comparison between the measurement comparison system and a 40-ft. discus buoy, etc., are presented.

07. World Climate Data Programme.
Guidelines on the quality control of data from the World Radiometric Network. [Geneva:] World Meteorological Organization, [1987]. [31] p.
ROCKVILLE: QC 851.W673 No.3

Prepared by the scientific staff of the World Radiation Data Centre in Leningrad, this document provides explicit guidance for the staff of cooperating centers on the general (technical and critical) quality control of contributed data from the World Radiometric Network as well a procedures for checking several specific kinds of data: global solar radiation; diffuse solar radiation; direct solar radiation; reflected solar radiation; sunshine duration; downward atmospheric radiation, upward terrestrial radiation, and net terrestrial surface radiation; longwave radiation, and net total radiation. Eight appendixes containing radiation data and descriptions of procedures are included.

D. STORAGE:

01. Bowin, Carl, and Julie Allen.
Geophysical data base and processing system. Pp. 178-183. In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251 pp.
ROCKVILLE: GC 10.4.E4 W68 1986

A computer-based system to store and process data on gravity anomalies and the geoid surface was developed to prepare global sets of gridded geophysical data to aid in the interpretation of the earth's structure, tectonics, and the driving mechanism(s) for plate motions. A Ridge 32C computer with RISC architecture and pipeline organization was selected to house the system. The software developed for the system consists almost entirely of programs and subroutines written in standard FORTRAN 77, with some C and Pascal code. The system runs under the UNIX operating system.

02. Briggs, Stephanie Alfieris.
A software package for processing conductivity-temperature-depth (CTD) data. Pp. 70-71. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

A software package is described for processing conductivity, temperature, and depth (CTD) data obtained from a Neil Brown CTD Model 1150 system. Processing consists of at least three steps and is, in part, performed by these package programs. The first program formats raw data into a standard format and flags possible spurious values. The second program inserts additional file documentation. The third program performs the remaining necessary data processing: temperature-conductivity matching, applying the conductivity cell correction factor, pressure sorting, low-pass filtering, and subsampling to desired final resolution.

03. Brown, Patricia, Kathe Lighty, Russell Merrill, Robert B. Kidd, and Philip D. Rabinowitz.

Collection and quality control of marine geological data by the ocean drilling program. Pp. 205-211. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.

ROCKVILLE: GC 57.M35 1986

A computerized database is being designed to archive geological data generated from shipboard and shore-based analyses of core samples from beneath the sea floor. These data include geophysical, geochemical, paleontologic, paleomagnetic, petrologic, and physical properties determinations. Standardized data collection procedures are being implemented. Computerized data entry forms with standard error checks are being designed for shipboard data collection. Error checks will include restrictions on values, checks on missing values, and sample identification. For descriptive data collection, online checklists will aid the scientists in entering pertinent data. This paper discusses the computerization on-board the drillship JOIDES Resolution, the organization of the database, and the benefits of the system to the scientific community as they apply to shipboard and shore-based studies.

04. Intergovernmental Oceanographic Commission.

Manuals and guides, No.17: a general formatting system for geo-referenced data. [Paris:] Unesco, [1988, etc.] 6v. Various pagings.

ROCKVILLE; GC 38.I55 No.17

To date the Manual comprises six volumes, most to be made available in English, French, Spanish, and Russian versions. Preparation and publication of some versions is still in progress. English titles are as follows: Volume 1 - Introductory guide to the GF3 formatting system; Volume 2 - Technical description of the GF3 format and code tables; Volume 3 - Standard subsets of the GF3 format; Volume 4 - User guide to the GF3-Proc software; Volume 5 - Reference manual for the GF3-Proc software; and Volume 6 - Quick reference sheets for GF3 and GF3-Proc.

05. Irish, James D., and Wendell S. Brown.

An archiving and analysis system for geophysical data. Pp. 64-69. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi:Marine Technology Society, Gulf Coast Section, 1986. 611 pp.

ROCKVILLE: GC 57.M35 1986

A software package has been developed for the reduction and analysis of geophysical data. Data are stored in binary files with headers which include the series name, start time, end time, sample interval, number of data points, and the time that the file was created. Before detailed analysis occurs, all data are "archived" on magnetic tape, and documentation is created which aids in the location and retrieval of the data. The general analysis routines permit the user to edit, normalize, select (join) pieces, filter or Fourier transform any selected file. Other programs compute the variance, cross-spectral energy density, cross-correlation, coherence, empirical orthogonal eigenfunctions, and frequency response functions. Special-purpose routines compute various derived seawater parameters and perform harmonic or response analyses for tides. Finallly, output routines permit the user to plot time series, x-y graphs with log or linear axes, or contoured presentation of results.

06. Langran, Gail, and Barbara Pfeil Buttenfield.
Formatting geographic data to enhance manipulability. Pp. 201-210. In: Auto-Carto 8, Proceedings of the Eighth International Symposium on Computer-Assisted Cartography, Baltimore, Maryland, March 29-April 3, [1987], edited by Nicholas R. Chrisman. [Falls Church, VA: American Society for Photogrammetry and Remote Sensing, and American Congress on Surveying and Mapping, 1988.] 763 pp.
ROCKVILLE: GA 102.4.E4 A87 1988

Geographic data tends to be exploited extensively and imaginatively once it becomes available. When standard data sets serve as input to applications software, however, the data must often be filtered or restructured. Given this likelihood, special attention should be paid to any distributed data set's manipulability. This paper discusses ways to organize sequential data sets to facilitate three major filtering tasks: windowing, categorical feature selection or aggregation, and resolution reduction. Examples are drawn from current format standards.

07. Mass, Clifford F.
The use of compact disks for the storage of large meteorological and oceanographic data sets. Pp. 53-56. In: Sixth International Conference on Interactive Information Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342 p.
ROCKVILLE: QC 874.3.I5 1990

The compact disk appears to offer a practical alternative medium for distributing widely used moderate to large meteorological and oceanographic data sets, and for permitting the migration of the analysis of such large data sets to smaller computer systems.

08. Patterson, Steven L., and Michael T. Simmons.
Cataloging of NODC archives on the NASA Ocean Data System. Pp. 379-382. In: Oceans '86: Conference Record,...Washington, D.C., September 23-25, 1986. [New York:] IEEE, 1986. 5v. 1472 pp.
ROCKVILLE: REF TC 1505.C63 1986

The efficient management of rapidly increasing quantities of satellite-derived oceanographic data and related in-situ data poses a major challenge for the immediate future. In an effort to respond to this challenge the National Ocean Data System (NODS) was developed at the Jet Propulsion Laboratory. NODS is a computer-based online data information system which provides a data catalog, sample browse files, and data acquisition capabilities. The Global On-Line Data (GOLD) catalog of NODS provides a user with the ability to identify data sets which meet his specified search criteria. NODS is being linked via a telecommunications network with various remote archives, including the National Oceanographic Data Center (NODC). In order to evaluate the GOLD catalog's utility for in-situ data, NODC elected to load initially information about its archive of drifting buoy data. This identified some problems, which led to recommendations for improving the GOLD catalog design.

09. Verhoef, Jacob, Ron Macnab, and John Woodside.
Geophysical data bases at the Atlantic Geoscience Centre. Pp. 1068-1073. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

Geophysicists at the Atlantic Geoscience Centre (Dartmouth, Nova Scotia) have recently completed a major overhaul and compilation of marine gravity and magnetic data collected off the east coast of Canada, and have enhanced these observations with other information collected over adjacent land and sea areas: aeromagnetic data, land gravity measurements, gravity values derived from satellite altimitry, bathymetry, and depth to basement. The resulting data sets have been organized for efficient handling and storage. Used in conjunction with recently implemented tools for rapid data manipulation and display, the data bases are a valuable resource for scientific research. This paper describes the general procedures followed in implementing the data bases, and presents some sample display products.

E. ACCESS AND DISSEMINATION:

01. Campbell, W.B., and M.L. Weaks.
An inexpensive interactive processing system for NOAA satellite image. p.1626. (Abstract only.) In: Oceans '88: proceedings,...Baltimore, Maryland, October 31-November 2, 1988. [New York:] IEEE, 1988. 1732 pp.
ROCKVILLE: REF TC 1505.C63 1988

A PC-based image processing system has been produced to enhance the image analysis functions within NOAA and to facilitate high-quality product creation and rapid dissemination. It uses basic commercially available components and NOAA-written software. This system allows for display of mapped, gridded, full 11-bit resolution image formation from LAC, GAC, or GOES images. The dynamic color enhancement utilities allow for easy interpretation of thermal structure details because each area of an image can be custom-enhanced with as many or as few color intervals as necessary and annotated on separable non-destructive overlay planes for future use or direct distribution. The software is menu-driven and quite simple to operate.

02. Dahl, Thomas E.

Wetlands mapping in the coastal zone: progress towards a national digital data base. Pp. 465-473. In: Coastal zone '87: proceedings of the Fifth Symposium on Coastal and Ocean Management, Seattle, Washington, May 26-29, 1987. New York: American Society of Civil Engineers, 1987. [4835 pp.]

ROCKVILLE: HT 392.S94 1987

To date approximately 90 percent of the coastal zone of the lower 48 states has been mapped by the National Wetlands Inventory (NWI). A number of Federal and State agencies have expressed an interest in having this information available in digital map form with corresponding acreage summaries and statistics. This paper describes the status of NWI mapping in the coastal zone and discussed steps which are under way to construct a coastal wetlands database for the Great Lakes as a precursor to a national coastal wetlands data base.

03. Duernberger, Paul M.

Microeconomic factors of the Navy/NOAA Oceanographic Data Distribution System. Pp. 490-493. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.

ROCKVILLE: GC 57.M35 1986

The Navy/NOAA Oceanographic Data Distribution System (NODDS) provides an efficient method of accessing unclassified numerical products and data from the Navy's Fleet Numerical Oceanography Center at Monterey, CA. Recent increases in the number of users and connect-hours have prompted a review of the benefits of the system and the search for an algorithm for forecasting future usage. Regression techniques are used to compile this algorithm.

04. Fulker, David W.

Unidata: facilitating data access and use. Pp. 155-161. In: S i x t h International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342 p.

ROCKVILLE: QC 874.3.I5 1990

The purpose of the Unidata program is to facilitate university education and research in the atmospheric sciences by improving the accessibility and usefulness of relevant data. A nationwide computing and communications system has been built through the joint efforts of many universities and the Unidata Program Center in Boulder, Colorado, which is managed by he University Corporation for Atmospheric Research under the sponsorship of the National Science Foundation. Attributes of the system, experience to date in development and operation of the system, and the characteristics of the Local Data Management (LDM) subsystem and the Network Common Data Form (netCDF) are described.

05. Gagnon, J.J., J.R. Keeley, and P.A. Bolduc.
Machine contouring oceanographic observations. Pp. 1101-1104. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

The Canadian Marine Environmental Services Branch has developed capabilities to generate machine-contoured displays of oceanographic variables in both horizontal and vertical planes of the ocean. Grid interpolation and optimum interpolation techniques are presented. Temperature anomaly maps of near real-time in-situ observations are used to describe the capabilities of both methods of depicting oceanographic variables.

06. Gagnon, J.J., P.A. Bolduc, and J.R. Keeley.
Management of real time oceanographic data. Pp. 1097-1100. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

With the advent of improved communications systems and on-site processing hardware in recent years, the Canadian Marine Environmental Data Services Branch (MEDS) now makes available real-time and near real-time in-situ oceanographic, wave, and tides-and water-level data to its user community. Oceanographic data accessed from the Integrated Global Ocean Station System, for data collected within one month of the observation, is quality controlled, archived, and accessible to users on a weekly basis. Daily surface gravity wave spectra are also accessible through this same network. Tides and water-level data for Canadian stations are accessible on a daily basis through the Tidal Acquisition and Telemetry System. This paper describes the data sources, communications and processing systems, quality control criteria, and some data products currently available from these data received in MEDS.

07. Gibson, Jannie.
International Satellite Cloud Climatology Project (ISCCP) central archive catalog of data and products. Washington: National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, National Climatic Data Center, Satellite Data Services Division, 1987. 1v. Various pagings.
ROCKVILLE: QC 921.I58

This catalog describes the data, products, and supporting information that are available to users from the ISCCP Central Archive (ICA) and procedures for ordering data and products. The latter include B1 data (nominally 10 km resolution visible [VIS] and infrared [IR] data at 3 hr intervals for quasistationary satellites, and global 4 km resolution data for polar orbiting satellites), B3 data (nominally 30 km resolution data with supporting information) and C Cloud Climatology Products. Supporting information, such as inter-calibration and satellite history information, is also available from the ICA.

08. Goldberg, Michael.
Automatic content-based cataloging of satellite images: a data management approach for global change research. Pp. 44-47. In: Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342 p.
ROCKVILLE: QC 874.3.I5 1990

A practical systems approach for improving the accessibility of satellite imagery is described. The design is suitable for proof-of-concept implementation because it emphasizes the use of currently operational image-processing and database management techniques. The impacts on competing resources are modest considering the benefits to be gained.

09. Guy, Eugene V., and Judith A. Whittick.
Canadian sea ice information system: CSIIS. Pp. 1085-1090. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

CSIIS is a database and information system which enables scientists and engineers to gain access to ice data abstracted from consultant, industry, and government reports, as well as historical ice concentration data collected during routine ice reconnaissance operations. Quantitative data are presented as statistical summaries of the author's results or as raw data. The user may obtain distribution and drift track mapping, frequency histograms, and x-y plots. Text files provide descriptive comments on field techniques used to collect data and to advise the user of any unusual environmental conditions occurring during the study. CSIIS also incorporates a statistical analysis package and a bibliographic search package.

10. Hamilton, Douglas, and Janet Ward.
On-line access to NODC information services. Pp. 637-640. In: Oceans '88:...proceedings, Baltimore, Maryland, October 31-November 2, 1988. [New York:] IEEE, [1988]. 1732 pp.
ROCKVILLE: REF TC 1505.C63 1988

Oceanographic data holdings of the National Oceanographic Data Center (NODC) are large and varied. A goal at NODC is to provide timely information about those data to users via online computer access. NODC has now developed a prototype system, called NOSIE, (NODC Ocean Science Information Exchange), that includes descriptions of NODC data files, helps for sending or ordering data, interactive inventory summaries, and bulletin boards. NOSIE is a menu-driven, modular system to which information resources of various types can easily be added. It was designed using system software for screen management to provide a consistent "look" and "feel" during each session. Future plans are to expand inventory summaries, add detailed inventories, and make subsets of ocean files or special data sets directly accessible on line.

11. Hardy, Iris A., and Andrew G. Sherin.
What value old data? Pp. 1079-10884. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

Most scientific organizations have accumulated large collections of data over their lifetime. How much this information is worth, is discussed with reference to the literature on the economics of information and library services. Factors are identified which enhance the value of data. These factors are illustrated with case histories from the Atlantic Geoscience Centre (Dartmouth, Nova Scotia). The level of resources necessary to preserve or enhance the value of data are explored.

12. Hatch, Warren L.
Selective guide to climatic data sources. [Washington:] NOAA, [1988]. 389 pp.
ROCKVILLE: REF Z6685.U.64 no.4.11 1988

This guide was designed to assist potential users of climatic information by acquainting them with the various forms in which the data are archived and the producuts or publications that are prepared from the data. Information is provided on 215 separate climatic data sets filed in the archives of the National Climatic data Center (NCDC) in Asheville, N.C. A brief review of pertinent historical facts and the basic climatological elements associated with each data set are included.

13. Hess, Kurt W., and Peter J. Pytlowany.
Geographic display of circulation model data. Washington: National Oceanic and Atmospheric Administration, 1989. 45 pp. (NOAA Technical Memorandum NESDIS 27)
ROCKVILLE: QC 879.5.U43 No. 27
A project is described which was designed to put circulation model data into a geographic mode for display in combination with other fields. Satellite image display software used in the project allows for overlaying several planes of different types of data on top of a gridded field in geographic format, and hence is essentially a geographic information system (GIS). The GIS, the numerical circulation model, the procedure for converting model data to pixel format, and the computer program used in the project are described, and application of the system to the Chesapeake Bay is demonstrated. A listing of the OVERLAY computer program is given in an appendix.

14. Holland, C. Randy.
Artificial intelligence and the extraction of marine environmental information. Pp. 433-436. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

Semiconductor digital electronics technology now permits the rapid collection of vast amounts of accurate marine environmental data. The usefulness of such data is limited, however, until processed into a higher-level form and merged with other information to provide answers to important questions. This paper discusses the application of the expert systems technology, a subset of artificial intelligence

technology, and how such systems can be and are being used to improve the speed and efficiency of converting data into useful answers. The paper discusses those parts of the "data flow" sequence that would benefit from expert systems processing and describes some available tools for the extraction of knowledge and construction of the expert systems software program. Limitations, potential difficulties, and examples of some recent expert systems work are discussed briefly.

15. Howey, Terry W., and James H. Blackmon.
Use of a geographic information system as a tool for making land use management decisions for coastal wetlands in a state regulatory program. Pp. 399-413. In: Coastal zone '87: proceedings of the Fifth Symposium on Coastal and Ocean Management, Seattle, Washington, May 26-29, 1987. New York: American Society of Civil Engineers, 1987. [4835 pp.]
ROCKVILLE: HT 392.S94 1987

A geographic information system (GIS) was developed as a tool for making decisions concerning proposed activities possibly affecting coastal wetlands. The GIS, based on a Data General MV-10000 computer, uses the Map Overlay and Statistical System (MOSS) as the main software package. When an application is received to conduct a regulated activity in a coastal zone, the analyst is given a standard package of information on the locality, including detailed data on waterfowl and habitat areas. Additional data are provided to the technical staff on demand as required. The use of GIS data as part of the standard permit application review process began in October 1986 after six years of concept development, database building, hardware and software acquisition, and implementation. Detailed information is provided on the hardware, software, data bases, and the review process.

16. **INFOCLIMA catalogue of climate system data sets.** [Geneva:] World Meteorological Organization, 1989. 508 pp.
ROCKVILLE; REF QC 851.W673 No. 5

This issue of the catalog includes all the information received in the Secretariat of the World Meteorological Organization up to March 1989. It contains 1031 data set descriptions (plus 386 area and/or category cross-references) from 268 data centers in 112 countries, and it has been prepared from the computerized INFOCLIMA data base. It is expected that the information about data sets and data centers will retain its useful value over a sufficiently long period to warrant only an occasional re-issue of the catalog.

17. Intergovernmental Oceanographic Commission.
Manuals and guides, No.16: marine environmental data information referral catalogue....Second edition. [Paris:] Unesco, 1985. Unpaged.
ROCKVILLE: GC 37.5.I55 No.16

The Marine Environmental Data Information Referral System (MEDI) was established on the recommendation of a Joint Task Team with participation by representatives of FAO, IAEA, ICES, IHO, IOC, Unesco, UNEP, WHO, WMO, and IMCO. The system, which is operated by the Intergovernmental Oceanographic Commission through its MEDI Coordination Centre as a sectoral focal point of UNEP/INFOTERRA, contains technical

descriptions of the marine data holdings of the participating organizations in machine-readable form to enhance the service capabilities of marine data centers. The catalog is intended to demonstrate the full scope of the system.

18. Intergovernmental Oceanographic Commission. Technical Committee on International Oceanographic Data Exchange.
IODE handbook; revised edition. [Paris:], Unesco, 1988. Various pagings.
ROCKVILLE: GC 38.I5 1988

A revised edition of the Handbook, first published in 1984, will be issued every two or three years and lists information on the composition of the International Oceanographic Data Exchange System. It also contains practical information relating to the IODE Technical Committee and its subsidiary bodies. Member States participating or willing to participate in IODE activities are invited to keep the Secretariat of the IOC informed of all changes to the Handbook's content, particularly insofar as IODE National Coordinators and members of the TC/IODE subsidiary bodies are concerned. Amendments will be published, if available, every six months.

19. Koehn, Mark P., and Warren W. Denner.
NODDS - the Navy/NOAA Oceanographic Data Distribution System: an update. Pp. 518-521. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

The Navy/NOAA Oceanographic Data Distribution System (NODDS) provides commercial and government users access to a wide variety of Navy environmental products and data in near real time. The present NODDS is described, including some recent improvements. Future plans for the system are outlined, which, among other developments, will allow users access to satellite data and products. Examples of currently available data and products are shown.

20. Konnai, Kouichi, Yoshikatsu Okabe, and Masanobu Okuyama.
Fleet data management system (FDMS) using INMARSAT system. Pp. 168-172. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

This paper describes the Fleet Data Management System developed for use in telex or telephone networks carried by the International Maritime Satellite Organization (INMARSAT) System. The FDMS provides a telex-channel automatic data transmission capability and an error-free telephone-channel data transmission (1200/2400bps) capability between on-board personal computers and a shore-based computer. These functions meet the need of ship owners for efficient management of fleet data through: (1) continuous monitoring of ships by fully automated data transmission, and (2) exchanging data between ship and shore via PC's.

21. Lynch M.P., K.L. McDonald, J. Berger, and R. Smith.
Determining and servicing marine pollution data and information needs of estuarine and coastal zone managers and decision makers. Pp. 472-478. In: Proceedings, Tenth National Conference [on] Estuarine and Coastal Management,...New Orleans, Louisiana, 12-15 October 1986. Bethesda, MD: The Coastal Society, 1987.
ROCKVILLE

The Ocean Pollution Data and Information Network (OPDIN) includes a Central Coordination and Referral Office (CCRO) and regional services through National Oceanographic Data Center liaison offices in Anchorage, AK, Seattle, WA, La Jolla, CA, Miami, FL, and Woods Hole, MA. The CCRO serves primarily the Washington, D.C., metropolitan community of managers and decision makers, and provides national services to the regional offices. The regional offices deal with the communities in their respective regions on a day-to-day basis and have an intimate understanding of the current issues and resources in their regions.

22. Quayle, Robert G.
Climatic data in the coastal zone - our climate as a natural resource. Pp. 4053-4060. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. New York: A.S.C.E., 1989. 4978 pp.
ROCKVILLE: HT 392.S94 1989

A brief overview is given of available climate data services, including primary data sources, types of data, and methods of access.

23. Sampson, Glen W., and George Clark.
An inexpensive solution for the mass distribution of satellite images. Washington: National Oceanic and Atmospheric Administration, 1987. 116 pp.
ROCKVILLE: QC 995.U68 No. 201

A method for the mass distributionn of satellite images is described. The system is based on the IBM Personal Computer, with remote users tied into a central distribution point via dialup telephone connections. The central distribution point receives data from a GOESTAP line or a WEFAX signal and compresses the data into satellite images to service requests from remote users. Remote users retrieve the data by dialing the central distribution point. Once the data have been retrieved, the remote user can display single images, animate a series of images, and manipulate the enhancement curve used to display the images. Complete instructions are provided for duplicating the system.

24. Sand, R.L., J.R. Goulet, L.J. Bass, and S.H. Koelb.
The design and management of a large ecosystem database using a scientific database management system. Pp. 169-173. In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251 p.
ROCKVILLE: GC 10.4.E4 W68 1986

The MARMAP Ecosystem Data Base Information System (MEDBIM) is a system for processing and analyzing scientific data collected at sea by the National Marine Fisheries Service. MEDBIM contains data on the abundance, composition, location, and condition of U.S. commercial marine fishery resources. It has reached a size of over 150 million characters with anticipated additions of over 10 million characters per year. A relational data base management system called DATMAN was chosen to support MEDBIM, and this paper discusses the structure, content, and operation of MEDBIM as implemented on DATMAN.

25. **Satellite data distribution.** Pp. 180-185. In: Weather satellites: systems, data, and environmental applications, edited by P. Krishna Rao, et. al. Boston: American Meteorological Society, 1990. 503 pp.
ROCKVILLE: QC 879.5.W39 1990

The ground data-handling and distribution system in the U.S.A. is described briefly.

26. Shum, C.K., B.E. Schutz, and B.D. Tapley.
Digitized global land-sea boundary data base and its access software. Pp. 497-499. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

A global data file, which contains digitized information that enables identification of a given latitude/longitude-defined point as over land or water was generated from a data base which defines the world's shorelines. The land-sea boundary map also includes information on islands and inland lakes. The resolution of this map is approximately 5'x5' or an equivalent of 9km-square surface blocks at the Equator. The software to access this data base is easily transportable to different computers. This data base was used in the generation of the Seasat Geophysical Data Record (GDR) to identify whether spaceborne radar altimeter data applied to land or ocean areas. A further improvement to this data base can be achieved by including other information, such as, for example, seasonal ice boundaries and continental shelves.

27. Somers, Robert, Ben Jones, and Steve Snyder.
Managing and disseminating data necessary for coastal wetland management in South Carolina. Pp. 4125-4128. In: Coastal zone '89: proceedings of the Sixth Symposium on Coastal and Ocean Management, Charleston, South Carolina, July 11-14, 1989. [4978 pp.]
ROCKVILLE: HT 392.S94 1989

When developing policies for the management of wetlands, it is important to first identify the location and extent of the valuable natural resource, and second, to develop a means to disseminate this information to the public. National Wetland Inventory (NWI) maps give the public the opportunity to know the location of wetlands as defined and delineated by the United States Fish and Wildlife Service, but statistical information describing the number and areal extent of habitat types by

political boundaries is lacking. The use of a geographical information system (GIS) to analyze, retrieve, update, and display spatially oriented data provides the statistical capabilities needed to manage and understand the vast amount of information contained within the NWI maps.

28. Soreide, N.N., and S.P. Hayes.
EPIC: an oceanographic data archival and retrieval system. Pp.174-177. In: Proceedings, Working Symposium on Oceanographic Data Systems, Fourth, San Diego, CA, February 4-6, 1986. [Washington:] IEEE Computer Society Press, 1986. 251 pp.
ROCKVILLE: GC 10.4.E4 W68 1986

EPIC was developed to manage the large quantity of oceanographic data collected by NOAA Pacific Marine Environmental Laboratory (PMEL) oceanographers during climate study programs such as EPOCS and TOGA. It currently provides access to over 2000 data sets from CTD, XBT, TOPS profiling current meter systems and from other oceanographic instruments. Data sets are selected interactively by specifying geographic location, time, and depth. Station locations of selected data can be displayed on a map. A user can generate data plots and listings from the selected data sets with interactive and user friendly programs. On-line help describes EPIC programs and data formats. EPIC is written in FORTRAN 77 on a VAX 11/785 running under VMS.

29. Szabados, M., G. Withee, and K. Schultz.
NOAA's shipboard environmental data acquisition system. Pp. 230-233. In: Oceans '85: Proceedings,...San Diego, California, 12-14 November 1985. New York: IEEE, 1985.
ROCKVILLE: TC 1505.C63 1985

NOAA's National Ocean Service (NOS) is implementing the Shipboard Environmental Data Acquisition System (SEAS) program to expand and augment NOAA's current activities in the collection of oceanographic and marine weather observational data. The SEAS program provides a system that delivers data from the ships at sea accurately and quickly for use in operational forecast systems. SEAS data are incorporated into analyses at the National Meteorological Center.

30. Szabados, Michael, Charles Roman, and Bob Taylor.
Transmission of real time oceanographic and meteorologic data from ships. Pp. 863-869. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

The Shipboard Environmental [Data] Aquisition System (SEAS) was developed by the National Oceanic and Atmospheric Administration (NOAA) to provide accurate meteorological and oceanographic data from vessels in real time through the use of satellite data transmission techniques. SEAS automatically transmits data through the GOES satellite system. Currently SEAS has the capability to transmit ship surface weather observations, XBT data, CTD, and current profile data. The system is expandable and future upgrades to the system will include XCTD, automated meteorological sensors and interfacing to an acoustic doppler current meter. SEAS

is designed around an IBM PC-compatible computer and requires 512k of memory and an 8087 coprocessor chip.

31. Ward, Conley R., and William E. Hubert.
A database and network system for worldwide marine observations and products. Pp. 500-504. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

This paper outlines the application of Global Weather Dynamics, Inc.'s (GWDI) Unified Message Switch (UMS) to support centralized marine databases, database users, and associated user networks. GWDI operates a data service and provides systems which, in marine data applications, will (a) collect, process, and store marine observations and products, (b) maintain operational hydroclime files, (c) generate products in user-selected formats, and (d) distribute these products on request, or on a preset schedule, or on an event basis. Advances such as centrally produced forecasts and advisories and increased observational coverage are welcome but insufficient. This paper focuses on the additional need for ease of access to the marine observations and information.

32. World Climate Data Programme.
CLICOM Project (climate data management system). [Geneva:] World Meteorological Organizationm, April 1989. [41 pp.]
ROCKVILLE: QC 851.W673 No. 6

This document describes CLICOM, the computer hardware system, software, and training package developed by the U.S. National Climatic Data Center in connection with the World Climate Data Programme project entitled "Transfer of Technology in Climate Data Management and User Services". The Data Management Module developed for CLICOM is a microcomputer-based climatological data processing system which provides the capability to digitize, quality-control, manage, and analyze climate data. Capabilities are included to control all other aspects of climate data management as well, such as detailed historical information on the locations and observing practices of stations, data dictionary information, and data inventories. A system overview, menu summary, and detailed specifications for software and hardware are given as well as a training outline and description of a stepwise approach to data base building.

F. GENERAL:

01. Bendel, William B.
The dependency of global change research on the computer industry. Pp. 41-43. In: Sixth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. Preprints. Boston: American Meteorological Society, [1990]. 342 pp.
ROCKVILLE: QC874.3.I5 1990

This paper briefly examines some of the principal concerns surrounding global change research and the computer industry. These topics include: data management and accessibility, data integrity and security, data storage, and computer power requirements.

02. Clark, David M., and John J. Kineman.
Global databases: a NOAA experience. Pp. 216-232. In: Building databases for global science. Edited by Helen Mounsey. London/New York/Philadelphia: Taylor and Francis, 1988. 419 p. Refs., table, maps.
ROCKVILLE: HZ 699.5.E3B8 1988.

The data collection activities of the five operational components of the National Oceanic and Atmospheric Administration (NOAA) are briefly outlined and the work of the National Environmental Satellite, Data, and Information Service (NESDIS) and its three data centers is described in slightly more detail. It has been estimated that the total volume of data in the NESDIS data centers in 1998 will be more than 264 thousand gigabytes (GB), with the average database containing 963 GB. NOAA has undertaken a series of experiments with data management systems and its experience with two of them is recounted at some length.

03. **Climate system monitoring (CSM) monthly bulletin.** World Climate Programme. Geneva: World Meteorological Organization,0 July 1984- .
ROCKVILLE: PER

The Bulletin contains, as a routine feature, global analyses of temperature and precipitation anomalies and statistics which indicate the persistence of hot/cold and wet/dry events; global analyses of sea-surface temperature, outgoing long-wave radiation, circulation anomalies, and drought-monitoring indices. The identification of anomalies requires the availability of statistics from long time-series of data from each individual observing station.

04. Coates, Richard E., and David J. Lane.
The Personal Computer Oceanographic Database (PCOD) for ARGOS PTT data management. Pp. 1074-1078. In: Oceans '87: proceedings,...Halifax, Nova Scotia, September 28-October 1, 1987. [New York:] IEEE, 1987. 5v. 1772 pp.
ROCKVILLE: REF TC 1505.C63 1987

This paper describes a PC-based system that allows the ocean scientist to process, manage, and collect data collected from instrument platforms equipped with Argos satellite transmitters. The system accepts data either by hand entry or via modem in near real time during an experiment and also has the capability to import data received on magnetic tape from a mainframe. The data management, translation, analysis, and presentation capabilities of the database system are also addressed.

05. Hunolt, Gregory, et. al.
Satellite data archiving: data management and user services. Pp. 186-198. In: Weather satellites: systems, data, and environmental applications, edited by P. Krishna Rao, et. al. Boston: American Meteorological Society, 1990. 503 pp.

ROCKVILLE: QC 879.5.W39 1990

The functions of data archiving and management range from policy-making in relevant areas to the functions of data reception, quality control, cataloging, preservation, and services provided to near-real-time and retrospective users. This paper describes succinctly user requirements for services, satellite data management operations, models, satellite data and products from a data management perspective, data management systems technology, and the impact of new processing and communications technology.

06. Integrated Global Ocean Services System.
Joint IOC-WMO Working Committee for IGOSS: summary report, Fifth Session, Paris, 14-23 November 1988. [Paris: Unesco, 1988?] Various pagings.
ROCKVILLE: GC 38.J6 1988

The Committee heard reports from IGOSS officers and secretariats as well as a large number of national reports on international activities. These were followed by sessions devoted to the IGOSS Observing System (IOS), IGOSS Data Processing and Services System (IDPSS), IGOSS Telecommunications Arrangement (ITA), IGOSS regional implementation, the IGOSS training and assistance program, IGOSS publications, adoption of the 1989-1995 Plan, the intersessional work program, and a review of previous resolutions and recommendations of the Joint Working Committee and the Executive Councils of IOC and WMO. The twelve annexes cover a number of activites and specifications related to IGOSS data collection and management.

07. Intergovernmental Oceanographic Commission.
Reports of meetings of experts and equivalent bodies: IODE Group of Experts on Marine Information Management. [Paris:] Unesco, [1987]. Various pagings.
ROCKVILLE: GC 38.I58 1986

A report of the meeting is given. Agenda topics included: revision of the MEDI (Marine Environmental Data) referral system, future development of the ASFIS Aquatic Sciences and Fisheries Information System), development plan for marine information and related matters, future TEMA (Task Team on Training, Education, and Mutual Assistance) activities in support of marine information management, other marine information management activities in the Intergovernmental Oceanographic Commission, and review of the terms of reference of the Group of Experts. [Note: IODE is an acronym for the IOC Technical Committee on International Oceanographic Data and Information Exchange.]

08. Intergovernmental Oceanographic Commission.
Reports of meetings of experts and equivalent bodies: IODE Group of Experts on Technical Aspects of Data Exchange, Fourth Session, Ottawa, Canada, 11-15 July 1988. [Paris:] Unesco,[1988]. Various pagings.
ROCKVILLE: GC 38.I6 1988

A summary of the meeting is given. Agenda topics included: development and promotion of the GF3 system (General Formatting System for Geo-referenced Data), review of the ROSCOP system (Report of Observations/Samples Collected by Oceanographic

Programs), implications for IODE (IOC Technical Committee on International Oceanographic Data and Information Exchange) of recent technical approaches to data exchange, plans for a workshop on application of new technology to oceanographic data management, training and mutual assistance activities, and an action plan for the next intersessional period. National reports are contained in an appendix.

09. Intergovernmental Oceanographic Commission.
Reports of meetings of experts and equivalent bodies: Second Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow, Ottawa, Canada, 18-22 January 1988. [Paris:] Unesco, [1988]. Various pagings.
ROCKVILLE: GC 38.J6 1988

A summary report of the meeting is given. The agenda included the following topics: review and monitoring of IGOSS/IODE data flow, review of implementation of recommendations relating to the work of the meeting, procedures used by different centers for data handling and exchange, identification of ways to overcome problems of non-real-time submission of BATHY and TESAC messages, improvement of quality control procedures, application of IGOSS data in the IODE system to meet user needs, and publications. Ten annexes are included, some of them substantial, covering a variety of topics. [IODE is an acronym for the IOC Task Force on International Oceanographic Data Exchange; IGOSS is an acronym for the Integrated Global Ocean Station System.]

10. McGuirk, D., and William Propest.
Using CLICOM for climate data entry, quality control, data archiving and retrieval; the preparation of user products. Pp. 7-19. In: WMO region III/IV training seminar on climate data management and user services.... [Geneva:] World Meteorological Organization, [1986]. [84 pp.]
ROCKVILLE: QC 851.W673 No.1

Detailed instructions are given on how to enter, correct, update, and export CLICOM data. Information is also given on climatological data products from CLICOM: what is available and how it is produced.

11. Quayle, Robert G., and Daniel J. Manns.
An evaluation of the WMO non-real-time marine data exchange system. Pp. 59-63. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi:Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

Since 1961 about 40 countries have participated in a World Meteorological Organization program to assure that all ships' weather observations are digitized and archived in one of eight selected data centers throughout the world. Each center has responsibility for a part of the world ocean. The U.S. area is the Western North Atlantic and the Eastern Pacific. The National Climatic Data Center has made efforts to purchase or exchange data from all other nations so that a complete databank is archived for the entire world ocean. This study reviews data received by radio and mail for the U.S. and other countries. For U.S. ship data, increases of 150% or more

are achieved by adding non-real-time data to radio receipts. For non-U.S. sources, increases via the WMO program are significant, but not nearly as great as increases for U.S. ships. This suggests that not all data are being exchanged. Increased data acquisition efforts could greatly increase the amount of data we obtain from other countries.

12. Savastano, Kenneth J., and Nikki Bane.
SEAMAP data management system and products. Pp. 509-517. In: Proceedings mds '86: Marine Data Systems International Symposium, New Orleans, Louisiana, April 30-May 2, 1986. NSTL, Mississippi: Marine Technology Society, Gulf Coast Section, 1986. 611 pp.
ROCKVILLE: GC 57.M35 1986

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a unique, cooperative State/Federal program for the collection, management, and dissemination of fishery-independent data in the southeastern United States. The SEAMAP data management is the program's nucleus, processing data collected from research vessels, satellites, aircraft, and observers aboard fishing boats. The system is designed to provide: (1) a smooth flow of standardized uniform data from field collections to analysts; (2) individualized products to a large and diverse user community; and (3) data archival capabilities for future utilization. Six data subsystems have been developed, including: environmental, shrimp, finfish, plankton, satellite, and near real-time.

13. U.S. National Advisory Committee on Oceans and Atmosphere.
National Environmental Satellite, Data, and Information Service (NESDIS): managing a national environmental archive. Pp. 63-77. Chapter 5 In: An assessment of the roles and missions of the National Oceanic and Atmospheric Administration. College Station, TX: Texas A & M University, February 1987. 114 pp.
ROCKVILLE: REF QC 851.U54 1987

The history, function, and organization of the NESDIS Office of Information Services (OIS) are reviewed; the findings and conclusions of the Committee's study of NESDIS/OIS are summarized, and the Committee's recommendations on the role of the Federal Government--in particular, the role of NESDIS--in the management of the national retrospective environmental data base, and on improvements to NESDIS data management systems and policies in carrying out its mission are outlined.

14. U.S. National Oceanographic Data Center.
Accomplishments, FY 1988. [Washington:] March 1989. (NODC Informal Report No.9.)
ROCKVILLE: GC 37.5.N33 1988

Noteworthy events and accomplishments during the fiscal year are reported under six headings:"From the Director"; natural resources; products and services; development and technology transfer; planning and evaluation; and management, administration, and supervision. Three appendixes provide information for FY 1988 on NODC archive updates, NODC publications, and NODC visitors.

15. Unninayer, S.

The global system, observing and monitoring change, data problems, data management and databases. Pp. 357-377. In: Building databases for global science, edited by Helen Mounsey. London/New York/Philadelphia: Taylor and Francis, 1988. 419 p.

ROCKVILLE: HZ 699.5.E3.B8 1988

A convenient definition of the global climate system divides the system into sets of components: an "internal" set consisting of the atmosphere, the hydrosphere, and the cryosphere, and an "external" set consisting of the lithosphere and the biosphere. With this definition as a framework the author discusses requirements for observing and monitoring the global system; problems of data quality, space/time resolution, and data management; types of datasets required to monitor and study the global system; and the mix of databases required for research and planning.

16. World Climate Data Programme.

Guidelines on the structure, management, and operation of climate data centres. prepared by the Inter-Commission Meeting on Climate Data Centre Design and Operations, Atmospheric Environment Service, Downsview, Ontario, Canada, 29 October-2 November 1984. [Geneva:] World Meteorological Organization, [1985]. [72 pp.]

ROCKVILLE: QC 851.W674 No. 99

Ten pages are devoted to a discussion of the purpose, function, and structure of climate data centers. This discussion is followed by an equal amount of space devoted to data collection and communication, quality control and processing, structure of the data base, and its management. The main body of the text closes with a discussion of data center outputs and products, data security, and staff facilities. The nine appendixes include a list of participants, examples of data collection, data collected, and center products, a discussion of manual vs electronic collection procedures, monitoring network performance, building a data bank, and data types and monthly manpower requiremenmts.

17. World Climate Data Programme.

Statistics on regional networks of climatological stations (based on the INFOCLIMA world inventory); Volume I: WMO Region III - South America. [Geneva:] World Meteorological Organization, 1987. [40 pp.]

ROCKVILLE: QC 851.W674 No. 127

An inventory of climatological stations is being prepared by the WMO Secretariat within the framework of the World Climate Data Information Referral Service (INFOCLIMA) project. The inventory in its final form is expected to contain information on about 40,000 Stations. Summarized information and statistics on the networks of climatological stations in the WMO regions (one volume for each region) are planned for publication in the form of World Climate Data Program reports. The present report constitutes Volume I of this series.

18. World Climate Data Programme.
Statistics on regional networks of climatological stations (based on the INFOCLIMA world inventory); Volume II: WMO Region I - Africa. [Geneva:] World Meteorological Organization, 1989. [31 pp.]
ROCKVILLE: QC 851.W673 No. 7

An inventory of climatological stations is being prepared by the WMO Secretariat within the framework of the World Climate Data Information Referral Service (INFOCLIMA) project. The inventory in its final form is expected to contain information on about 40,000 stations. Summarized information and statistics on the networks of climatological stations in the WMO regions (one volume for each region) are planned for publication in the form of World Climate Data Program reports. The present report constitutes Volume II of this series.

19. World Climate Data Programme.
WMO region III/IV training seminar on climate data management and user services; Barbados, 22-26 September 1986, and Panama, 29 September-3 October 1986. [Geneva:] World Meteorological Organization, [1986]. [84 p.]
ROCKVILLE: QC 851.W673 No.1

The seminar (given in English and Spanish at Barbados and Panama, respectively) was intended to expose participants to the principles of modern climate data management and to the user services being incorporated into the CLICOM Project of the World Climate Data Programme. The seminar covered the following topics: climate data management and standard user services, simple climate data applications such as the analysis of rainfall data to assist agricultural planning and decision making, and advanced data applications using climate and other geophysical data for natural resource management and modeling. Course content is summarized, as are questions and remarks by participants. A list of participants is included.

20. World Climate Data Programme.
WMO Region II/Region V Training Seminar on Climate Data Management and User Services, Yogyakarta, Indonesia, 21-28 October 1985. [Geneva:] World Meteorological Organization, [1987]. [109 pp.]
ROCKVILLE: QC 851.W674 No. 13

The seminar was directed at exposing participants to the principles of modern climate data management and applied user services being incorporated into the CLICOM Project of the World Climate Data Programme. Lecture notes are reproduced on using CLICOM, using the data base in agricultural planning, advanced applications, decentralized data management and user services, impact assessment in Indonesia, and models for climatological analysis and seasonal forecasting in Indonesia. Questions and remarks of participants , comments by experts, and seminar evaluations are included. A list of participants and a description of the CLICOM Project are appended.

21. World Climate Research Programme.
The Global Precipitation Climatology Project; second session of the International Working Group on Data Management (Madison, USA, 9-11 September 1987). [Geneva:] World Meteorological Organization, March 1988. [28 pp.]
ROCKVILLE: QC 851.W675 No. 6

The session opened with status reports on the Global Precipitation Climatology Project (GPCP) and the individual (GPCP) centers. These were followed by discussion of the calibration/validation plan, the development and testing of algorithms and analysis techniques, the third draft of the implementation and data management plan, a proposal for a GPCP Quarterly Status Report and outstanding issues. A list of participants and approved agenda are appended.

22. World Climate Research Programme.
International Satellite Cloud Climatology Project (ISCCP): sixth session of the International Working Group on Data Management (Fort Collins, USA, 16-18 June 1987). [Geneva:] World Meteorological Organization, January 1988. [55 pp.]
ROCKVILLE: QC 851.W675 No. 3

The session opened with reports on the activity of the ISCCP and the individual data centers, on calibration and normalization procedures, development of an operational cloud algorithm, ISCCP pilot studies, and coordination of regional research programs. Fifteen open issues and recommendations are listed. Membership and participant lists as well as schedule summaries are appended.

23. World Climate Research Programme.
Report of the first session of the International Working Group on Data Management for the Global Precipitation Climatology Project (Washington, D.C., 12-14 November 1986). [Geneva:] World Meteorological Organization, [1987]. xx pp.
ROCKVILLE: QC 851.W674 No. 132

The report is introduced by a review of events leading to the establishment of the Global Precipitation Climatology Project (GPCP), the terms of reference of the Working Group on Data Management, and reports of activities of prospective participating centers. The functions and responsibilities of the data centers are outlined together with the data exchange control procedures and quality control procedures. Satellite precipitation algorithms and progress toward calibration and validation of measurements are discussed briefly. A list of participants, functional statements, data exchange schedules, and a list of action items are appended.

24. World Climate Research Programme.
Report of the seventh session, ISCCP Working Group on Data Management (Banff, Canada, 6-8 July 1988). [Geneva:] World Meteorological Organization, December 1988. [68 pp.]
ROCKVILLE: QC 851.W675 No. 13

Status reports are given on the overall International Satellite Cloud Climatology Project (ISCCP) as well as on the individual ISCCP data centers. These are followed by discussion of Satellite Calibration Center normalization procedures

and Global Processing Center calibration of NOAA polar-orbiting satellite data. Two chapters are devoted to external coordination and coordination of regional research programs. A list of attendees and summary agenda are appended.

25. World Meteorological Organization.
The contribution of satellite data and services to WMO programmes in the next decade. Geneva: World Meteorological Organization, 1987. 56 pp.
ROCKVILLE: QC 851.W6445 No.679

The present state of the global network of meteorological satellites, the applications of satellite technology in meteorology and operational hydrology, and the future role of meteorological satellites in WMO programs in the next decade are discussed. Chapter 4 not only makes projections for the future global network of meteorological satellites but also describes developments in data-processing systems which will enhance our ability to obtain useful information from meteorological satellite data.

26. World Meteorological Organization.
INFOHYDRO manual: institutions, services, rivers, observing stations, and data banks. 1987 edition. Geneva: World Meteorological Organization, 1987. Loose-leaf. (Operational Hydrology Report No. 28; WMO No. 683.)
ROCKVILLE: QC 851.W6445 No. 683

A computer-based and continuously updated information service called INFOHYDRO (Hydrological Information Referral Service) has replaced the WMO's Operational Hydrology Report No. 10: Statistical Information on Activities in Operational Hydrology. The loose-leaf INFOHYDRO Manual represents the startup of the INFOHYDRO service. The manual contains listings of national and international organizations dealing with hydrology and water resources, principal river and lake basins, and hydrological observing stations by continent (and in the South Pacific). The final chapter contains eighteen pages of tabulated information on hydrological data banks and archiving as well hydrological data collection and processing, both by region.